Research Product 81-17

A JOB AID FOR MODIFYING INEFFECTIVE
OR INEFFICIENT TRAINING PROGRAMS

ARI FIELD UNIT AT FORT KNOX, KENTUCKY

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This job aid addresses the problem of how to modify a training program when the need for changes has been identified through a Training Program Evaluation. These changes are changes to the training process rather than the subject matter of training. It is one of four job aids designed to formally evaluate the effectiveness and efficiency of the training process. The other three job aids in the set are: Research Product 81-15, A Job Aid for the Systematic Evaluation of Lesson Plans, Research Product 81-16, A Job Aid for the Structured Observation

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of Training, and Research Product 81-18, Guidelines for Conducting a Training Program Evaluation.

Guidance is provided on the development of training objectives, the conduct of practice events in training, providing feedback or knowledge of results, making training more efficient, and for modifying training programs to change the training environment, lecture/demonstration/practice events, and testing.

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A JOB AID FOR MODIFYING INEFFECTIVE
OR INEFFICIENT TRAINING PROGRAMS

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FOREWORD

The US Army Research Institute for the Behavioral and Social Sciences
Fort Knox Field Unit has a program of research designed to develop user-
oriented guidance and instrumentation for evaluating the effectiveness and
efficiency of institutional, transition, and sustainment training programs.
This job aid is one of a series of four to come out of that research. This
line of effort is responsive to requirements specified by the Army Training
Study in HRN 79-269, Methodology for Training Effectiveness Analysis (TEA),
and by the US Armor Center in HRNs 80-104, Methodology for Training Effective-
ness Evaluation, and 81-223, Methodology for Training Program Evaluation.
The work was conducted under Army Project 2Q263743A794, Education and Training.

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BRIEF

REQUIREMENT

The Army does not have a standard set of procedures for evaluating the effectiveness and efficiency of training programs. A need for such standardized formal procedures was identified by the Army Training Study in 1978. Guidance from the Army Training Study specified the development of procedural guides that would not require an analyst sophisticated in educational technology, would be applicable to established and developing weapon systems, and could be used in institutional, transition, and sustainment environments. This job aid satisfies the requirement for guidance in using accumulated data for making recommendations for training program modification.

PROCEDURE

Training Program Evaluation (TPE) was designed as a system for evaluating the effectiveness and efficiency of a training program. Decision rules, data collection formats, and analysis procedures for evaluating the soundness of a training plan as expressed in lesson plans and training materials, evaluating the training and testing process, identifying training and non-training courses of poor soldier performance in training, and for recommending modifications to training and testing that have a high probability of eliminating poor soldier performance in training were incorporated out of the civilian and military literature, industrial practice, and the experience of the research team.

Observable elements of the training process were specified. These elements, or items, included such things as whether or not everyone practiced the training task to standard, if the training aids specified by the lesson plan were used, whether or not tasks were demonstrated, if testing was contaminated by unwarranted prompting, etc. These items were formatted into a worksheet and given several field trials with typical users. The major field trial was conducted in conjunction with the M1 tank OT-III.

Following the series of field trials, lessons learned were compiled and the items, guidance, and suggested worksheet formats were finalized. Suggested program modifications were devised to correct any problems found. This was done separately for each related set of observable items. Program modifications are indexed, therefore, to problems observed in the training itself or training plans/materials. Because of the importance of training objectives, practice, and feedback to training effectiveness, separate sections on these topics were developed using training literature, experience, and lessons learned as guidance.

There are four job aids in the series; one for evaluating lesson plans and training materials, one for systematically observing training and testing, one for use by the training analyst to guide him or her through the entire process, and this job aid.

FINDINGS

The TPE system has been used in several operational training program evaluations and has provided training process data not heretofore available. Users have found these data useful for "fixing" training problems.

UTILIZATION

Preliminary versions of the TPE materials have been provided to the Armor Center and School, the Armor and Engineer Board, and the Office of Armor Force Management and Standardization (OAFMS) at Fort Knox, the Soldier Support Center at Fort Benjamin Harrison, the Artillery School at Fort Sill, the Ordnance Center at Aberdeen Proving Ground, the Infantry School at Fort Benning, the US Army Training and Doctrine Command (TRADOC) Deputy Chief of Staff for Training, TRADOC Training Development Institute, and the National Defense Headquarters at Ottawa, Canada. Final versions have been requested. In addition, the system has been implemented, all or in part, at Fort Hood where the TRADOC Combined Arms Test Activity, TRADOC Systems Analysis Activity, the Armor Center, and OAFMS used it to evaluate the New Equipment Training for the Ml tank, at Fort Knox where it has been used to evaluate the Advanced NCO course, Ml Tank Basic Armor Training, M60A3 Basic Armor Training, and at Fort Bliss where it has been used as a baseline for a system for evaluating the NET programs accompanying Air Defense developing weapon systems.

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SECTION I

INTRODUCTION

Each job in the Army is composed of a set of duties. These duties are, in turn, composed of performance tasks. Every soldier in the Army is responsible for being proficient on a set of tasks, usually compiled into a Soldiers Manual. To insure soldier proficiency, the Army trains each soldier on each task.

The US Army Training and Doctrine Command (TRADOC) has provided guidance for training development in TRADOC Pamphlet 350-30, Interservice Procedures for Instructional Systems Development (ISD), August 1975. Some of the training being developed and conducted does not follow this guidance, however, because many of the training developers and deliverers have not been trained in the development of a training process; they are subject matter experts who are detailed to training development. Training is typically developed under a concern for what is being trained. How that training is developed, conducted, and evaluated is usually given less attention. Because training is seldom subjected to formal evaluation, bad training may go uncorrected. This job aid and the other three job aids in this set (listed below) provide techniques for formally evaluating the training process. Their use should measurably upgrade training development, conduct, and evaluation in the Army.

The set of four job aids addresses the evaluation of training materials, training observation, how to correct training problems discovered during evaluation, and how to use training observation and test data to analyze the efficiency and effectiveness of training programs. These four job aids are:

Research Product 81-15, A Job Aid for the Systematic Evaluation of Lesson Plans, which will help you evaluate lesson plans for adherence to sound training development principles.

Research Product 81-16, A Job Aid for the Structured Observation of Training, which will help you and/or the training observer see and record useful data for evaluating training programs.

Research Product 81-17, A Job Aid for Modifying Ineffective or Inefficient Training Programs, which will help you decide what training modifications should be made to correct training problems discovered during a Training Program Evaluation (TPE).

Research Product 81-18, Guidelines for Conducting a Training Program Evaluation (TPE), which will help you decide if there were performance deficiencies on in-course tests, the likelihood of these performance deficiencies being caused by training, what is probably wrong with the training program, and what modifications are called for by the analysis.

This job aid, then, addresses the problem of how to modify training when you have conducted a TPE and found that certain changes are needed. These changes

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are changes to the training process, not the subject matter of training. "What" needs to be trained is the responsibility of the training proponent and is not covered in these job aids. The job aids, to keep the system as clean and simple as possible, are only concerned with how the training was planned and carried out.

This system assumes an underlying model of training.

If soldiers are being training to do something, to perform a task, the following five activities should take place regardless of training content.

. Enabling Knowledge. First, the instructor must present the words and concepts needed to think about and talk about the task. This material is usually presented in lectures, films, slides, reading assignments, discussions, etc.

. Demonstration. When the soldiers have a firm grasp on what things are called and what the task is all about, the performance element of the task should be demonstrated for them. This shows them how to perform the task and gives them a "model" performance against which they can compare their own task performance. Demonstrations must be presented so that they can be seen and heard, by all students, and be in small enough steps so that students can follow the instructor's actions. Demonstrations should be conducted on the actual equipment whenever possible.

. Part Task (Subtask) Practice. After the demonstration, the soldiers should be required to practice the task. They should be required to practice the task until they have reached the training standard for the task. If the task is composed of a number of subtasks, the demonstration-practice sequence should be performed for each subtask separately. The key here is that each soldier should practice each subtask and task until he or she performs to standard under the appropriate conditions, at least once without instructor assistance.

. Whole-Task Practice. When a task is composed of several subtasks, and part-task practice is scheduled for each subtask, a training event is needed to put all the subtasks together into a smooth overall task performance. This activity is called whole task practice. The soldiers should practice the subtasks in the sequence required by the training objective. They should practice this integrated series of subtasks until they have reached the training standard. All soldiers should get individual hands-on practice on both part and whole tasks.

. Test. Following practice, the soldiers should be tested to see if they can perform the task to the training standard. The test should be no less realistic than the final practice event, and should rigorously measure the soldier to the training standard and under the training conditions specified in the training objective. Training should not be attempted during testing and, if possible, the testers should be different people from the trainers.

Before observing the training, you should examine the training materials for adherence to sound training design principles using Research Product 81-15. While the training is going on, you and/or training observers should attend the training sessions to gather data on the training process (using the suggested worksheet, or adaptations of the suggested worksheet in Research Product 81-16). You should then examine the test score data to determine if a performance deficiency exists. A performance deficiency is defined as a percentage of the soldiers being NO GO on the first test trial. Usually, 20% or more first time NO GO's will constitute a training performance deficiency for the purposes of the training analysis. Remember that the focus here is on the effectiveness and efficiency of the training program. Most of the soldiers will be retested and eventually be given a GO. For the analysis of the training program, however, 20% or more first trial NO GO's will trigger an analysis of the training (see Research Product 81-18).

You will need to take the test score data, the observations made by yourself and/or the training observers during testing, the observations made during training, and any other information that is available, and determine if the reason for the excessive number of first time NO GO's lies with the training process. This procedure is covered in the Analyst's Job Aid, Research Product 81-18. If that determination is affirmative, the Analyst's Job Aid will help you decide what the causes of the training problems were from the data on hand. Section VI of this Job Aid contains a rather exhaustive list of causes. The observations that will lead to the selection of a cause and suggestions on how to modify training to decrease the number of first time NO GO's are detailed for each cause.

This "analysis" process is detailed in the Analyst's Job Aid and is only mentioned here to point out what the process consists of, in general.

This job aid is slanted towards the training of individual rather than collective tasks. The system described in these four job aids is also applicable to crew/squad/section/platoon training. Some modification may be necessary to fit particular cases. The major modification will probably come in the observation of training. Collective training usually cannot be observed as closely as individual training. The thing to remember is that collective training should follow the same model as individual training (see page 2) and should be documented in a lesson (or training) plan that follows the guidance in Research Product 81-15. See the Analyst's job aid, Research Product 81-18, for a fuller discussion of the use of TPE during collective training.

SECTION II of this Job Aid goes into some detail on training objectives. All training starts with a training objective. It determines what is taught, to what level of proficiency, under what conditions. Since a poorly written training objective will block attempts to evaluate the training process by failing to provide a clear goal for training, this section provides guidance on how training objectives should be written.

SECTION III talks about practice. Skill development depends on practice. Observation of training has shown repeatedly that not enough attention is paid to practice. This section provides some general guidance on practice in training.

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SECTION IV talks about feedback. Feedback is often called "knowledge of results" but it is more than that. Feedback is a process. It is a process whereby the correctness of an action is judged against some goal. Early in training, the instructor feeds performance information back to the soldier. The instructor tells the soldier when he or she is or is not performing correctly. A goal of training is to get the soldier to provide his or her own feedback. The soldier needs to be able to judge, while performing, if the actions being taken are correct and will lead to successful task performance. SECTION IV provides some general guidance on feedback.

SECTION V points out some ways of making training efficient. The guidance in SECTION V may appear obvious. Observation of training has shown, however, that the problems discussed happen all the time.

SECTION VI is the heart of this Job Aid. In Section VI, the items from the Job Aid for the Structured Observation of Training, Research Product 81-16, are clustered into "problems." The Table of Contents to this Job Aid lists these "problems." For each such problem, SECTION VI provides a short definition of what probably is wrong with training, the training observation items included in that problem, and recommendations for training program modification. Some of the problems are training process problems. Some have to do with where training is taking place, the training site. Still others concern training management. This list is not exhaustive but, hopefully, it includes all the major "problems" that can occur. The solution strategies offered are for the training analyst's use. Since the training analyst does not develop or administer training, most of the recommendations direct the analyst to suggest modifications to those who do. This is not a manual on how to develop or conduct training. If the suggestions in this Job Aid are followed, however, there should be few major problems with the process of training.

SECTION VII lists some job aids that are available on the ISD process. These job aids expand on the guidance available in TRADOC Pamphlet 350-30.

TRAINING OBJECTIVES

Training starts with a well written training objective. The training objective tells the instructor, soldier, and the training manager three very important things: what it is that the soldier will be able to do after training that he or she could not do before training (the TASK), the conditions under which the soldier will be able to do it including what the soldier will have available to help with the performance (the CONDITION), and how well the soldier must do it to get a GO (the STANDARD).

Notice that the focus above is on training, not the job. A common mistake is to use a job task description for a training objective. Training objectives are written from job task descriptions. They are seldom the same.

Good training objectives are hard to write. They take a lot of thought and a lot of work. Draft objectives have to be shown to instructors and soldiers to see if what the writer thought he said is what the reader thinks he said. If more than a few instructors or soldiers misinterpret the TASK, CONDITION, or STANDARD, it should be rewritten. In this case, the fault usually lies with what has been written, not with the reader.

The TASK

The TASK statement lays out in detail what it is that the soldier will be able to do after training that he or she could not do before training. The focus is on the word "DO." Action verbs are required to describe what soldiers do. Soldiers can <u>repair</u> things when they are broken, they can <u>replace</u> things when they do not work any more, they can <u>disassemble</u> things that are already put together, they can <u>assemble</u> things that have been taken apart, they can <u>name</u> things when they are pointed to, they can <u>describe</u> what they would do when something goes wrong. It is best to avoid more general terms like <u>hitting targets</u>, <u>familiarizing</u>, and <u>taking appropriate action</u>, because they are not specific enough to adequately describe the task to be accomplished.

The CONDITION

The CONDITION statement lays out in detail the environmental conditions under which the soldier will be able to do the TASK <u>and</u> the tools, job aids, etc., that he will have available to help with TASK performance.

Soldiers cannot perform tasks under NBC conditions in training because nuclear and biological agents cannot be used in a training environment. They may be able to perform under certain chemical conditions, however, if they are clearly specified. If soldiers are to perform under conditions of darkness, then they should be made to perform when it is dark. If, however, "darkness" here means using light attenuating goggles, then the CONDITION should specify light attenuating goggles.

If TASK performance requires the use of a tank, or a rifle, or a wrench, or a manual, or a job aid, then that should be specified and provided to the soldier when he or she is required to perform the TASK.

The STANDARD

The STANDARD lays out in detail how well the soldier must do the task to get a GO. The STANDARD does not list what the soldier does, it lists the criteria for knowing when it has been done right. It tells the soldier and an outside observer when acceptable performance has been reached.

Standards are usually written in terms of time and/or accuracy. The standard for repairing something is usually expressed in terms of how long it takes and whether it works as it should when repaired. If a soldier has to replace something, he usually has a limited amount of time to do it in and all the connections have to be complete and accurate. Disassembly usually involves time and all the right pieces being taken out, perhaps in some specified sequence. The sequence, however, is stated in the TASK, not the STANDARD. When something is assembled, all the right pieces are usually back in and it works. In all of these, the steps to be performed and the performance sequence, is described in the TASK. The STANDARD tells the instructor and soldier how long he or she has to do it in and refers to the TASK for the correct performance steps.

A good training objective is the opening key to good training. The TASK lists what has to be trained, the CONDITION lists the environment and the tools required, and the STANDARD tells how well it has to be done. Training events derive from the TASK. The TASK defines what words and concepts have to be taught to the soldiers, what has to be demonstrated to them, what they have to practice, and what the test items have to contain. The TASK, CONDITION, and STANDARD define the test. If the training objective is not well written, the entire training program suffers.

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SECTION III

PRACTICE

For learning to occur, the soldier has to do something. When the soldier is doing something specifically to learn a skill, the activities are called "practice." For almost all skills, hands-on practice is necessary for successful training. The paragraphs in this section explain important points about practice.

1. <u>A soldier learns to do whatever he or she practices in the learning situation.</u>

If correct performance is practiced, correct performance will be learned. If incorrect performance is practiced, incorrect performance will be learned. It is important, therefore, for soldiers to perform correctly during hands-on practice. For this reason practice must be supervised by instructional personnel.

2. <u>Each soldier should practice until he or she performs the task correctly at least one time.</u>

Each soldier should practice the task until he or she gets it right at least once. Beyond that point there is no magic formula that says how much practice is enough. The amount of practice needed can be determined during the try-out of the lesson plan. Of course, typical training input should be used during the try-out.

3. <u>How long practice sessions should be and how often they should occur depend on the particular task being taught, how experienced the soldiers are, and how often they will be able to perform the task in the near future.</u>

Task elements required for correct performance often become confused among themselves in the minds of soldiers in training. In skill learning, this confusion often increases during early practice of an unfamiliar task. This is especially true when the task requires several elements to be coordinated at the same time. It is also true when a soldier has to decide which of several alternative actions to take based on available cues (or information). For a while it may seem that every new thing a soldier learns becomes confused with things learned earlier. In such cases, it is often necessary, early in training, to have short, frequent practice sessions on each training task. The training should shift to different types of tasks at the end of each short session. It may also be necessary to practice only parts of tasks at first. Soldiers with a lot of experience in similar tasks are not as likely to confuse task elements. They can usually practice larger parts of tasks and can practice for longer periods of time.

Future opportunities to perform a task help determine how often practice sessions should be held. The concern here is the soldiers ability to retain the skills involved. If later training activities for other tasks do not include the performance of previously learned tasks, the previously learned tasks will be partially forgotten. The training program should include periodic practice of any task that is not performed regularly.

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4. **Progress should be made during practice.**

As obvious as this point seems, it is often ignored. Progress is crucial, for if it does not occur, the soldier is practicing at least some incorrect performance. Furthermore, because progress should occur, failure to make progress is a good indication that something in the training needs correcting.

Judgments as to whether progress is occurring must be made by assistant instructors who are monitoring practice. This means, of course, that the training plan includes the requirement for enough assistant instructors and that the training delivery organization sees to it that they are at the training session.

5. **Soldiers should be intensively involved during practice.**

The number of soldiers per practice session and the schedule of practice events should allow little idle time during practice sessions. Idle time breeds socialization and daydreaming which compete with learning the task at hand. If the training situation is such that some soldiers are idle while others are practicing, concurrent training stations should be set up.

What the soldiers are practicing should be meaningful to them. To maintain motivation and provide a sense of realism while learning, they should be given the connection between what they do during practice and job performance requirements.

6. **Part-Task and Whole-Task Practice.**

Practice on a subtask, or on a step in a long sequence, or on a particular set of actions that are part of a task, is referred to as part-task practice. Part-task practice is necessary when a task is composed of many subtasks, e.g., performing before operations maintenance on a tank turret. The entire sequence of actions is too long and involved for the soldier to master in one practice session. It is more efficient to have the soldier master the sequence by groups of subtasks. After several subtasks have been performed to standard, then the soldier can begin to put them together. The practice event where the soldier attempts to put the subtasks together, to practice the entire task under the training condition to the training standard, is called whole-task practice. Whole-task practice will always be necessary for complex tasks. These two terms are used throughout the series of TPE job aids.

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SECTION IV

FEEDBACK

As necessary as practice is for learning, its value depends entirely on what happens while practice occurs. One learns a skill not by just trying to perform it, but by finding out which attempts are correct and which ones are not. In other words, the learner must receive information -- feedback -- that lets him know what is correct and what is not. Otherwise, there is no basis for continuing correct actions and dropping out the incorrect ones. The learner would not know the difference.

Depending on the newness of the task to be learned, and on the previous experience of the learner, a soldier may be able to recognize when a skill has been performed correctly. As a rule, however, there will be many aspects of the skill that the soldier cannot judge at first. For this reason, an objective of every successful training program, whether recognized or not, is that the soldiers learn to provide their own feedback. They should recognize the difference in what happens naturally when a skill is performed correctly and when it is not. Furthermore, they must be able to recognize the feedback while performance is going on so that timely adjustments in performance can be made.

At first the soldier will need a lot of help. An instructor may have to tell the soldier what is right, what is wrong, and what should be noticed. In many training situations, and especially during hands-on practice, such individual attention will require small soldier/instructor ratios. Many modern training devices can substitute for an instructor in this role, and in some cases do a better job because they can monitor what soldiers do more closely and accurately than an instructor can.

Accurate and timely feedback is so crucial to successful training that deficiencies in soldier performance following training almost always result when feedback is inadequate. The problem often reduces to instructors' having too many soldiers to work with or not knowing how important feedback is or how to provide it.

The principles below summarize some of the most important aspects of feedback in training.

1. <u>Feedback should be specific to the action.</u>

If feedback is to let a soldier know whether an action is right or wrong, he or she must be able to tell <u>which</u> action is right or wrong. If all actions are correct, of course, telling a soldier that the entire task was performed correctly also says that each action was correct. But if errors occur, a general statement that it was "done wrong" does not tell the soldier what actions must be corrected. The soldier needs to know what was right and what was wrong.

2. **Feedback must occur while the soldier still remembers clearly what he or she did.**

In practicing new tasks, soldiers often are groping and do not realize exactly what they are doing. Actions may be simply of the wrong sort. They may be too slow or too fast, too weak or too strong, too early or too late -- or even omitted. Except for omissions, there may be no clear memory a few seconds later of just what action was made. In this case, the soldier would need feedback without delay.

3. **When the sequence of actions required for task performance are such that each action depends on feedback from the previous action, no delay in feedback can be tolerated.**

In such cases the feedback, often through the "feel" of an action, is a cue for the next immediate action. The next action, then, cannot be started until its cue occurs.

4. **Feedback should be provided in ways that help the soldier see when progress is being made.**

In many cases soldiers will be able to recognize progress because they can see for themselves when they are improving. This is especially true when feedback that occurs naturally as a result of task performance can be correctly interpreted by them. It is also true for simple procedures when soldiers have memorized the steps or when a checklist is available for then they can check what they do against their memory or the list. But in many other cases, inexperienced soldiers cannot recognize when they are improving, even for simple procedures if these involve interpreting subtle cues. In these cases, soldiers must be told when they are acting correctly, either by an instructor or automatically by a training device. Soldiers will also need periodic recognition by an instructor to maintain their motivation.

SECTION V

WAYS OF MAKING TRAINING MORE EFFICIENT

Inefficient training can come about for a number of reasons but the most common reasons are either poor planning in the first place or poor execution of a good training plan. A good training plan (or lesson plan) will structure the learning process (the sequence, nature, and timing of the instructor and soldier activities) so as to maximize the efficient use of resources, both human and materiel. Faithful execution of this plan will produce these efficiencies. Occasionally this does not happen. Listed below are some problems commonly seen and recommendations for avoiding these problems. Some of these recommendations will seem almost too obvious to be printed here. The fact that these problems regularly occur during training suggests otherwise.

1. <u>The training site was not set up before training began.</u>

The training site, the place where the training is going to take place, should be set up to accommodate the training activities before the training begins. If the training will take place in a classroom, the classroom should be checked to make sure that the key is available, the lights work, the heat is on/off, there are enough chairs/desks, etc. If the training is equipment related, the equipment should be available, unlocked (if a tank, APC, etc.), serviceable, and all the parts attached and in working order. When soldiers arrive at the training site, it should be ready for them.

2. <u>The necessary training equipment was not at the site and/or in good working order.</u>

All equipment needed to train the soldiers should be ready at the site when the soldiers arrive and should be in good working order. Equipment availability and condition should be checked out 24 hours in advance. This allows enough time for repair or replacement when necessary. The word "equipment" in this case means everything that will be used at the training site, such as overhead projectors with viewmats, slide projectors with slides and screen, movie projectors, mock-ups, training simulators or devices, targets and target mechanisms, tools, soldier workbooks, hand-outs, etc. Class time should not be used to secure, check out, or repair anything used to train.

3. <u>Soldier hand-outs were not provided to them in advance or at the very beginning of training.</u>

All soldier hand-outs should be in their hands before training begins. This will ensure that everyone gets a copy of what is needed and will give the soldiers time to familiarize themselves with the hand-outs. When soldiers receive these materials during class time, time is lost while handing them out, class is disrupted, and time is lost while soldiers look the materials over.

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4. Concurrent training stations were not used when all soldiers could not be accommodated at a training site.

There should be no dead time in training. All soldiers should either be occupied at training activities or on a break. No one should be standing around waiting for something to happen. Breaks should not be lengthened because the training site will not allow all the soldiers to be actively engaged in training at the same time. There should be no lines at training sites. The Army has enough "hurry up and wait" situations that are forced by circumstances. In training, proper planning can avoid this. For example, in the case where there are not enough training sites to simultaneously accommodate all the soldiers, it would be better to eliminate one site and use that instructor for concurrent training than to have soldiers waiting around.

5. Current training duplicates previous training, within this course.

Good course design, which pays attention to the sequencing of objectives, should keep this from happening. What often happens, however, is that 1) instructors may not be aware of what preceded them and repeat earlier instruction, 2) they may know what preceded their block but do not feel that the soldiers are able to perform to standard on prerequisite skills/knowledge, or 3) they may know for a fact that previous training did not bring soldiers to standard on prerequisite skills/knowledge. Training developers and managers should be alert to this problem because the solution lies at their level. Training must be designed and implemented to ensure that soldiers are not allowed to progress in training unless they have mastered the earlier skills/knowledge which will enable them to profit from later instruction.

6. Unnecessary instruction was given on skills/knowledge the soldiers already had.

Soldiers are often given instruction on skills/knowledge they already have. This "refresher" training should really be necessary before the decision is made to give it. Soldier proficiencies should be checked, either formally or informally, before training starts. When soldiers are found to be proficient on tasks to be "refresher" trained, this training can be eliminated. Similarly, if only a few soldiers need this training, they should be the only ones to receive it.

7. Rapid completion of self-paced training was penalized.

Soldiers who completed a self-paced training module ahead of their peers were, in the soldier's eyes, penalized. Rules should be formulated, and given to the soldiers, for what will happen to them if they finish early. Training management must then stick to these rules. Whatever it is that happens to them when they finish early, it must be positively rewarding to them. Too often, rewards are dreamed up by soldiers senior to the ones in training and what is rewarding to them is not necessarily rewarding to their students. If these rewards are not positive, soldiers will make no effort to finish training ahead of what is considered "normal" time and one of the primary benefits of self-pacing will be lost.

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8. Practice time was cut in the name of efficiency.

Training should be focused on the needs of the soldier. If soldiers are to be task proficient, they need to practice in training. Since practice time is usually the long block of time in training, it is usually where cuts are made when training time is reduced. If proficiency is the goal of training, and practice produces proficiency, then cutting practice lowers proficiency. This should be remembered when pressures mount to cut training time. Reducing practice makes training quicker, not more efficient. If practice time has to be cut, standards should be lowered accordingly. This lowering of standards will make it clear to all what the effect of cutting training time has been.

SECTION VI

RECOMMENDATIONS FOR TRAINING PROGRAM MODIFICATION

This section contains recommendations for fixing training problems discovered during a training program evaluation. During the evaluation, problems may have been found in the lesson plans, training materials, training environment, during the observation of training and/or testing, or from reports from the instructors or soldiers. The problems listed in this section are keyed to the 109 items in <u>A Job Aid for the Structured Observation of Training</u> that is a part of this TPE system. The observer's job aid suggests the use of four Worksheets to assist in the collection of information on the training program. These Worksheets are referenced in this Section as sources of evidence for problems in training programs. These Worksheets are:

Worksheet 1, Training Plan – a Worksheet prepared by the analyst for the use of the observer.

Worksheet 2, Training Environment – contains items that direct the observer to attend to characteristics of the training site – items 1-25 in the observer's job aid.

Worksheet 3, Training Observation – contains items that direct the observer to attend to features of the training itself – items 26-89 in the observer's job aid.

Worksheet 4, Test Observation – contains items that direct the observer to attend to features of the testing process – items 9C-109 in the observer's job aid.

The organization of this section can be seen in the Table of Contents (page 1). Recommendations are keyed to items. Similar items (referring to the same problem) tend to be clustered together. The easiest way to find out what is in this section is to pick a problem from the list in the Table of Contents and find and read the appropriate page(s). For example, if the training observer notes that a lot of the soldiers were having trouble with the same step during practice (item 50), you would go to "Many Soldiers Had Trouble With the Same Step During Practice" on page 33. Suggestions for remedying that problem are presented.

Often, more than one thing is wrong with a training program. Sometimes one problem leads to another. For example, if the training objective is poorly written, the lesson plan will probably not provide a detailed plan for how to conduct the training since the goal is not clear. The test will probably not conform to the objective. Standards will not be consistent from instructor to instructor. The fix for this should be aimed at where the problem came from – a poor objective. Work to get the objective fixed first. The other problems may clear up then without additional effort on your part.

Remember that you would not be trying to fix training if it worked well. If training worked well, a high percentage (usually 80% or more) of the soldiers

would have been first time GO's on a "good" test over each training objective. "Good" is used here to mean that both you and the observer found no problems with the test (items 90 to 109). When training does not work well, it means that the program did not bring 80% (or whatever percentage you are using) of the soldiers to standard on each training objective. If you stick to the data (test scores and observations), whether the program worked well or not will not be your opinion. It will be a fact based on data and observations. If the program did not work, something needs to be fixed. Training can be fixed by changing objectives, resources, training methods, or prerequisite skills/knowledges.

More detail on how to use this job aid can be found in Guidelines for Conducting a Training Program Evaluation (TPE), Research Product 81-18.

TRAINING ENVIRONMENT: Number of Instructors

THE PROBLEM. Instructional personnel were not present in sufficient numbers
to ensure that soldiers were trained in the prescribed manner, on the equip-
ment provided, within the allotted time. For example, hands-on practice re-
quires assistant instructors to provide one-on-one supervision. The ratio of
soldiers to instructors has to be sufficient, during practice events, to ensure
this one-on-one supervision.

EVIDENCE for an insufficient number of instructors will come from Worksheet 2,
Training Environment.

   *Item 1. Were enough instructors present to provide adequate supervision
             and assistance?

    Item 2. Did you see any soldier wanting an instructor but none were
             available?

RECOMMENDATIONS for training program modification.

Not Enough Instructors Were Present for Training (Items 1 and 2).

There were not enough instructors available to ensure one-on-one supervision
during practice. Enough instructors/assistant instructors must be assigned to
training so that the training can be carried out as planned. This must include
a sufficient number of assistant instructors to provide the necessary one-on-
one guidance during practice activities (see Section III, Practice). Errors
made during practice become, if not immediately corrected, ground-in as part
of the skill. They then have to be "trained-out" at some future training
event. Assistant instructors must be on-hand to ensure that every soldier
practices the task until he reaches the training standard, correcting errors
in performance as they are made. Errors pointed out during critiques following
task performance will not correct faulty performance unless immediately fol-
lowed by additional practice events and the process repeated until error-free
performance is realized. This is not efficient. It is far better to correct
errors in performance as they occur. If providing assistant instructors in
the required numbers is not feasible, then training sessions should be
lengthened so that each soldier still receives the one-on-one training during
practice activities. Instead of two instructors training four soldiers in 60
minutes (30 minutes per soldier), for example, one instructor may train four
soldiers in 120 minutes (30 minutes per soldier). In this way each soldier
still receives the required supervised practice. If time and number of in-
structors cannot be changed, then training objectives must be modified to re-
flect what can be trained with the given resources.

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*Throughout Section VI, items marked with an asterisk require more judgment on
the part of the training observer. Items not so marked require that an ob-
servation be made, but less judgment is needed. See the Observer's and Analyst's
Job Aids for more on this.

TRAINING ENVIRONMENT: Training Equipment

THE PROBLEM. There was not enough training equipment available for each soldier to get hands-on practice to standard, or the equipment did not work properly. Training equipment includes all the things the soldier needs to practice on or with to learn to perform the task.

EVIDENCE for an insufficient quantity of training equipment will come from Worksheet 2, Training Environment.

    Item 3. Was the training equipment specified in the lesson plan used in the training?

  *Item 4. Was there enough training equipment to go around?

  *Item 5. Did the training equipment work properly?

    Item 6. Was the equipment necessary for training readily available when needed?

    Item 7. Did each soldier receive a copy of handouts or other materials used?

RECOMMENDATIONS for training program modification.

Required Training Equipment Was Not Used (Item 3).

The training equipment specified in the lesson plan was not used in the training. Effective training requires the use of the equipment specified in the lesson plan. If this equipment cannot be made available, the lesson plan will have to be rewritten using a different approach to training. Ask the instructors why the equipment specified in the lesson plan was not used. If it cannot be made available, training will have to be redesigned for what is available. If it just was not available this one time, steps should be taken to ensure its availability from now on.

There Was Not Enough Training Equipment/Materials (Items 4 and 7).

There was not enough training equipment to go around and/or each soldier did not receive a copy of handouts or other materials used. There should be enough training equipment to ensure that each soldier has what is needed to learn and practice the task. If some soldiers have to wait their turn on the equipment, which may be necessary for large, expensive items like tanks or trucks, concurrent training stations should be set up and manned by a separate set of instructors (see SECTION V, Ways of Making Training More Efficient). No one should have to share a handout. It is necessary to determine, in advance, how many copies of handouts or other training materials are needed so that actions to obtain what is needed can be taken.

Required Equipment Was Not Available When Needed (Item 6).

The equipment necessary for training was not readily available when needed. Training should not be interrupted or the planned sequence of events altered

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because the training equipment is not at hand. This is disruptive and reduces training effectiveness. Availability of needed equipment should be checked before training begins. Enough time should be allowed to get what is needed.

Training Equipment Did Not Work Properly (Item 5).

The training equipment did not work properly. It is almost impossible to train soldiers to standard using equipment and materials that do not work properly. It does not permit adequate practice, undermines soldier's confidence in their equipment, and causes soldiers to question the competence of the instructors. Training equipment should be secured by the instructors well in advance of the training and checked-out to ensure that it works properly.

TRAINING ENVIRONMENT: Training Site

THE PROBLEM. Environmental factors in the training site were such as to in-
hibit training effectiveness. That is, the site itself does not provide enough
space for effective training, or is inherently too noisy, or does not provide
enough light. At its very worst, the training site should be benign and at
least not detract from soldier learning and retention.

EVIDENCE for inadequacies in the training site will come from Worksheet 2,
Training Environment.

   Item 8.   Could all soldiers see and hear the instruction?

   Item 9.   Did the soldiers have enough elbow room?

  *Item 10.   Did the physical layout of the training environment make
              seeing demonstrations or audiovisuals difficult?

   Item 11.   Was the training site so noisy that you had trouble hearing
              the instructor?

  *Item 12.   Did the noise in the training area distract soldiers and make
              hearing the instructor difficult?

  *Item 13.   Is this a poor training site from the standpoint of noise
              distractions?

   Item 14.   Was there enough light for you to see what was going on?

  *Item 15.   Was there enough light for the soldiers to see what was
              going on?

RECOMMENDATIONS for training program modification.

All The Soldiers Could Not See and Hear Readily (Items 8, 9, and 10).

There just was not enough space to accommodate all the soldiers. The training
site should provide enough space so that each soldier can comfortably see
everything that goes on. No soldier should be screened by another soldier or
should have to strain to get a good view. If the training site is just too
small, a new site should be obtained for future training that eliminates the
space problems of the current site. If a new site cannot be obtained, fewer
soldiers per instructor will "expand" the space available at the current site.

The Training Site Was Too Noisy (Items 11, 12, and 13).

The training site was, by its nature, a noisy place. Motor pools are a good
example of this. The argument is often advanced that, since soldiers may have
to perform on the job in a noisy environment, they should learn in a noisy en-
vironment. This is not true. Soldiers should learn to perform tasks in sites
that are as free of distractions as possible. After task proficiency is

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gained, then they can practice in a noisy environment. The training site should be selected so as to enhance training. Noisy environments hinder effective training. If soldiers cannot readily hear the instruction, effectiveness (in terms of soldier performance) and efficiency (in terms of time to proficiency) both suffer. If the training site is just too noisy, a new site should be obtained for future training that eliminates the noise problems of the current site.

There Was Not Enough Light at the Training Site (Items 14 and 15).

The training site was so dark that the soldiers had difficulty seeing what was going on. Each soldier should be able to see clearly everything that goes on in training. The argument is often advanced that, since soldiers may have to perform on the job under conditions of reduced visibility, they should learn under conditions of reduced visibility. This is not true. Soldiers should learn to perform tasks in sites that are as free of distractions as possible. After task proficiency is gained, then they can practice under conditions of reduced visibility. If the training site is too dark, a new site should be obtained for future training that eliminates the lighting problems of the current site, or, if possible, the lighting in the current site should be enhanced.

TRAINING ENVIRONMENT: Distractions

THE PROBLEM. The training was interrupted, or the soldiers were distracted from training, by such things as equipment failure, instructor absence, inclement weather, VIP orientations, high ranking observers at the training site, administrative requirements, etc. This may look like a non-training problem but the effects of such interruptions are on soldier skill and knowledge. Test data will indicate where soldier performance deficiencies are. Remedial training may need to be scheduled to bring soldier performance levels up to standard.

EVIDENCE for the presence of distractions during training will come from Worksheet 2, Training Environment.

   Item 16. Were there observers at the training site other than yourself?

  *Item 17. Were soldiers distracted by the presence of civilian observers
             or high ranking officers?

   Item 18. Was training interrupted at any time?

  *Item 19. Was any training left out as the result of an interruption?

   Item 20. Did the soldiers complain a lot about the weather during
             training?

  *Item 21. Were the weather conditions so uncomfortable that soldiers were
             distracted from training?

  *Item 22. Were weather conditions at the training site so bad that train-
             ing was seriously affected?

RECOMMENDATIONS for training program modification.

Observers Were Distracting (Items 16 and 17).

Observers at the training site distracted the soldiers from training. The instructional staff usually has little control over the number, rank, and bothersomeness of observers. If the observers were so distracting that they actually interrupted training, a remedial training session may have to be scheduled. If they were just bothersome, steps may need to be taken to actively close the training site to anyone who does not belong there. Many times observers are just "official looking," and actually have no real business in the training site.

Training Was Interrupted (Items 18 and 19).

Training was interrupted, or stopped, for some reason. You may have to question the training observer, soldiers, and/or instructors to find out what happened. If the interruption was serious, remedial training may have to be scheduled. Serious interruptions are those that result in subtasks or tasks not being completely covered or practiced to standard by everyone. Acts of

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God and higher headquarters cannot be put off. Nuisance interruptions, however, can often be controlled with proper planning.

Inclement Weather (Items 20, 21, and 22).

Bad weather affected the conduct of training. Training must adjust to inclement weather. If the weather is bad enough to affect training, training should be postponed or moved to a sheltered site. Since this is seldom feasible, a more realistic solution is to modify the training process to offset, as much as possible, the effects of the weather on training. The problem, of course, is that when soldiers are uncomfortable, they attend more to their comfort than the training. Do not confuse training with the practice of tasks already learned. Once tasks are learned, they can be practiced in bad weather. First, training time during bad weather should be lengthened, not shortened. The amount of time any soldier is exposed to the weather should be shortened. Sheltered sites should be set up for concurrent training and should be manned by instructors. With such an arrangement, soldiers can be trained during several short sessions in the weather and can practice associated tasks in the sheltered site. Both soldiers and instructors can be shuttled back and forth. If none of these solutions are feasible, as may have been the case during the most recent training (or you would not be reading this paragraph), remedial training needs to be scheduled.

TRAINING ENVIRONMENT: Training Duration

THE PROBLEM. The time devoted to this training was either so short that the
instruction was rushed or some events were left out, or so long that soldiers
got bored or there was a lot of time where not much happened. Either extreme
is bad, with short time allotments the harder to compensate for.

EVIDENCE for too much or too little training time will come from Worksheet 2,
Training Environment.

>   Item 23. Did the instructors cover all the training events in the
>   allotted time?
>
> *Item 24. Was training so long that soldiers became bored or so short
>   that instructors were cutting practice time?
>
> *Item 25. Was the allotted training time too short or too long for the
>   training objectives?

RECOMMENDATIONS for training program modification.

Not Enough Time For All Training Events (Item 23).

There was not enough time to cover all the training events. The immediate
problem here is that one or more of the subtasks or tasks has probably not
been trained to standard. Additional training time needs to be scheduled to
pick up this missed training. Having done that, you will also have to figure
out why time was too short. If interruptions in training are not considered
here, time can be inadequate because the instructor is unsure of the material
and too slow, there are too many events scheduled for the allotted time, or
the instruction may be inefficiently designed. The instructor problem can be
easily corrected by rehearsing the instructional staff until they are profi-
cient. If there were just too many events for the time allotted, then more
time or training sites must be added (reducing the number of events is not an
acceptable solution). See "Allotted Time Too Short/Long For Objectives" below
(Item 25). If neither of these seems to be the case, the instruction may just
be inefficiently designed (see SECTION V, Ways of Making Training More Effi-
cient).

Actual Training Time Too Long/Short (Item 24).

Actual training time was so long that soldiers got bored or so short that in-
structors had to cut practice time. If all the training events were completed
but training went on and on for no apparent reason, the training was probably
scheduled for too much time. Overly long training leads to soldier boredom
that carries over to the next training session. It hurts soldier motivation,
a fragile commodity at best. If the training session is too long, it should
be shortened. This should be done carefully, however, a little at a time. Too
large a cut will lead to a worse problem. If training time was so short that
practice time was cut, training time needs to be lengthened and additional time
needs to be scheduled for this group of soldiers. Practice is the heart of
training. It is essential that enough time be spent in practice for each
soldier to demonstrate proficiency to standard.

Allotted Time Too Short/Long For Objectives (Item 25).

The time allotted in the lesson plan (or Program of Instruction or Training Schedule) was too short/long for the successful accomplishment of the training objectives. Training time here has to be considered along with training equipment and assistant instructors. The lesson plan (or Program of Instruction or Training Schedule) should specify enough training equipment and assistant instructors to permit each soldier to practice the task until he or she gets it right under the time standard specified for the task. The problem is one of arithmetic. You will have to find out how many training sites are planned, how many soldiers are in a usual sized class, how much classroom (general) instruction time is planned, how much time of instruction is planned for each individual soldier, and the time standard for the task. From this, you can determine minimum allotted time. An example follows.

If there are to be 10 sites (each manned by an assistant instructor; do not count any site that is not so manned) with five soldiers at each site (i.e., 50 soldiers for 10 sites is five soldiers per site), 30 minutes of general instruction, 10 minutes of individual instruction for each soldier, where each soldier is required to walk through the task one time and then practice until he or she can perform it one time to standard, and the time standard for the task is 10 minutes, then the total time that must be allocated is:

general instruction	= 30 minutes
plus	
five soldiers (per site) X 10 minutes (individual instruction)	= 50 minutes
plus	
two repetitions (at least) of the task X 10 minutes (standard) X five soldiers (per site)	=100 minutes
	————————
	180 minutes

If the soldiers are to be given a 10 minute break every hour, then an additional 20 minutes will be needed for two 10-minute breaks. Note that the nearly three and one-half hours does not allow time for anyone to get the task wrong during practice and does not allow any buffer time for contingencies. The three and one-half hours is the very minimum on this example. Do the arithmetic for the task to determine the minimum time allotment. If you cannot get the figures you need for input, then training has not been carefully planned. This problem should be brought to the attention of the training developer so that time allocations can be made. If you do the arithmetic and come up with the allotted time being too short or too long, notify the training developer so that the appropriate adjustments can be made. Do not shy away from this because it looks complicated. Insufficient time is a typical training problem that will occur again and again. If you do not correct it, chances are no one will.

LECTURE EVENTS: Training Objectives and Purpose

THE PROBLEM. Soldiers were not mentally prepared to receive the training by being given the training objectives, purpose for the training, how this training fits in with the rest of the course, and the consequences for learning or not learning to perform these tasks. These items should be required by the lesson plan and should occur at the start of each lesson.

EVIDENCE for the fact that the training objectives and purpose were not clearly communicated to the soldiers will come from Worksheet 3, Training Observation.

Item 26. Were soldiers told the training objectives?

*Item 27. Were soldiers told the training objectives, including tasks, conditions, and standards?

Item 28. Were soldiers told why this training is necessary?

Item 29. Were soldiers told how this task fits in with their eventual job duties?

Item 30. Were soldiers told how this training fits in with previous and future training?

Item 31. Were soldiers told what would happen to them if they did (or did not) learn this task?

Item 32. Did soldiers have a training schedule available to them?

RECOMMENDATIONS for training program modification.

Training Objectives Not Given To Soldiers (Items 26 and 27).

The soldiers were not given the training objectives in a clear and easily understandable format. It is understood here that all training objectives have three parts that must be given to the soldiers; the task statement that tells the soldiers what it is they must be able to do following training, the conditions statement that tells them what they will have to do it with and the conditions under which they will have to perform, and the standard that tells the soldiers how accurately and/or quickly they will have to do it to get a GO. All three parts must be in the lesson plan and all three parts must be given to the soldiers at the beginning of training.

Purpose For This Training Not Given To Soldiers (Item 28).

The soldiers were not told why this training is taking place. The training objective tells the soldier what he or she will be learning to do. The purpose tells the soldier why he or she has to learn it and why they have to learn it now. Most training developers use this opportunity to motivate the soldiers. For example, if the training objective tells the soldiers they will have to learn to fix "X," the purpose will tell them why they have to learn to fix "X"

instead of someone else and why they have to learn to fix it now instead of some other time. Such soldier put-offs as, "You need it to pass the test," or "You need it to get the MOS," or "You will need it on the job" should be avoided. If there is a good reason for giving this training in this course, this reason should be given to the soldiers. If there is no good reason, then perhaps the training should not be given in this course.

Soldiers Were Not Told How This Training Fits In With Other Training (Items 29 and 30).

The soldiers were not told how this training fits in with previous and future training events and/or eventual job duties. Soldiers learn better if they can see a logical progression in the training events. It also helps them prepare for the coming training events. Making these connections increases soldier efficiency in training. Tying training to eventual job duties helps soldiers develop a feel for the whole job, giving them a framework for hooking the various tasks together in a sensible fashion.

Consequences For Learning/Not Learning Not Given To Soldiers (Item 31).

The soldiers were not told what would happen to them if they did (or did not) learn to perform these tasks. If there are no rewards for learning these tasks, and/or there are no penalties for not learning them, it will be very hard to motivate soldiers. In essence, it will make no difference to them if they learn or not. Consequences for learning/not learning may be at the course level rather than the task level, but there should be consequences. All re-rewards and penalties should be given to the soldiers.

Soldiers Did Not Have A Training Schedule Available (Item 32).

There was no training schedule readily available to the soldiers. Soldiers should know in advance where they will have to be, what they will be doing, what the uniform requirements will be, when they will have to be on duty before or after normal duty hours, etc. Training schedules which provide this information should be given to the soldiers or posted where they can easily see them daily. Frequent changes to training schedules undermine soldier confidence in the instructional staff and should be avoided where at all possible.

LECTURE EVENTS: Terminology

THE PROBLEM. The instructor did not provide the concepts and terminology
needed by the soldiers in a clear and easily understandable manner. This is a
two stage process and both stages should always occur. First, the instructor
should determine if the soldiers really know what he or she thinks they already
know, that is, verify the prerequisite knowledge. Then, the terms and concepts
needed for task performance should be provided to the soldiers in such a
fashion that they can easily understand and use them.

EVIDENCE for an inadequate transfer of terms and concepts from the instructor
to the soldier will come from Worksheet 3, Training Observation.

> Item 33. Did the instructor question the soldiers about what they were
> already supposed to know?

> Item 34. Did the instructor tell the soldiers how the equipment worked
> and label the parts?

> *Item 35. Did the instructor define terms new to the soldier and identify
> newly introduced equipment?

> *Item 36. Did the instructor provide the concepts and terminology needed
> by the soldiers?

RECOMMENDATIONS for training program modification.

Prerequisite Knowled e Was Not Assessed (Item 33).

The instructor did not question the soldiers about what they were already sup-
posed to know. Sometimes (but rarely) this is not necessary because the sol-
diers have been pretested on baseline knowledge and skills and the results
provided to the instructor. If the soldiers have not been pretested, however,
the instructor should ask enough questions to satisfy himself (or herself)
that the soldiers do indeed know what the lesson assumes they know. If they
do not, remedial training is needed before task training begins. If this group
of soldiers is typical of future input, training has to be modified to include
this additional training.

Necessary Terms and Concepts Were Not Effectively Given To The Soldiers (Items
34, 35, and 36).

Terms and concepts needed by the soldiers for task performance were not pro-
vided to the soldiers in a clear and easily understood format. The first
event in any sequence of training events is a discussion or lecture where the
instructor establishes the terms and concepts needed for him (or her) and the
soldiers to talk about the task. Things are named or labelled, equipment is
introduced, working relationships between parts are explained, required read-
ings on gauges and dials are established, rules or strategies are introduced,
underlying concepts are explained, etc. This has to be done in such a fashion
that the soldiers readily understand the material and can converse easily about

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the task using correct terms and concepts. Training should not progress to a practice event until the instructor is sure that the soldiers understand and can use the appropriate terms. If the soldiers cannot use the appropriate terms, they will not be able to describe their own performance and will not be able to ask intelligent questions about the task. If soldiers cannot describe correct task performance, they will not retain their skill. Instructors should question the soldiers to determine if they have grasped the required terms and concepts.

DEMONSTRATION/PRACTICE: Demonstrations

THE PROBLEM.   Either the task was not demonstrated for the soldiers or the
demonstration that was given was not effective.   All tasks should be demon-
strated, either by an instructor or by a film or a series of slides.   Well
written technical or operator's manuals may help a demonstration but should
not substitute for a live or filmed demonstration.

EVIDENCE for missing or poor demonstrations will come from Worksheet 3, Train-
ing Observation.

    Item 37.   Were the tasks demonstrated by the instructor?

   *Item 38.   Was each subtask demonstrated?

   *Item 39.   Were demonstrations conducted on the equipment listed in the
               lesson plan?

   *Item 40.   Could demonstrations be seen and heard by all soldiers?

   *Item 41.   Were demonstrations conducted in small enough steps so that
               the soldiers could easily follow the instructor's actions?

    Item 42.   Did the instructor ask the soldiers for questions immediately
              following the demonstration?

RECOMMENDATIONS for training program modification.

Tasks Were Not Demonstrated (Items 37 and 38).

Subtasks and/or tasks were not demonstrated for the soldiers.   Demonstrations
are an essential part of the training process.   They provide soldiers with a
model of satisfactory task performance.   They give soldiers something to com-
pare their task performance against so that they can begin to judge for them-
selves whether their performance is within acceptable limits.   Demonstrations
should be conducted by the instructor whenever this is feasible.   Films,
slides, or other pictorial methods may be substituted but only if absolutely
necessary.   The practice of "talking" or "walking" soldiers through a task is
an acceptable substitute only if it is followed by extensive practice with
feedback by the instructor (see SECTIONS III, Practice, and IV, Feedback).

Demonstrations Were Not On Equipment Listed In Lesson Plan (Item 39).

Demonstrations were not conducted on the equipment listed in the lesson plan.
The equipment used for demonstration should be noted by the observer so the
equipment match from demonstration to practice to test can be tracked.   Mis-
matches may affect soldier performance.   A reasonable progression would carry
the soldier from simulation/mock-ups to operational equipment.   The reverse of
this would be ineffective.

Demonstrations Could Not Be Seen/Heard By All Soldiers (Item 40).

Some soldiers had trouble seeing and/or hearing the demonstrations. You will
have to rely on the training observer's comments to find out why the soldiers
could not see or hear. If the problem lies in the training site itself, i.e.,
it was too crowded or too noisy, see page 19, TRAINING ENVIRONMENT: Training
Site. If the problem lies in the way the demonstration was conducted, i.e.,
the instructor did not speak clearly or loudly enough, the instructor's actions
were screened by his body or some feature of the training site or training
equipment, etc., the instructor will have to redesign the demonstration.

Demonstrations Were Not Conducted In Small Enough Steps (Item 41).

Demonstrations were not conducted in small enough steps so that the soldiers
could easily follow the instructor's actions. Step size refers to the amount
of information needed to get from one step to another in task performance. We
are all familiar with very large step sizes from high school. They usually
came in mathematics books when the author said, "The solution is obvious and
left up to the student." The solution was seldom obvious because the step
size was too big. There was too much information needed to get from that to
problem solution. Large step sizes are all right for soldiers who have al-
ready mastered the tasks since they have mastered the material. Soldiers new
to the task have to have it broken down into small steps so they can follow
along without getting lost between steps.

Clues to problems with step size will come from observations made by the train-
ing observer. If instructors backtracked to add information (fill in between
steps) that they felt was necessary for complete understanding, or added in-
formation to the instruction that is not part of the current lesson materials,
then they are already aware of the step size problem. They need to bring the
lesson plan into conformance with practice by adding the additional steps or
information to the plan for giving the demonstration.

If instructors had to backtrack to add information in response to soldier ques-
tions, and this information appeared to add to soldier understanding, the in-
structors have not identified a set of needed additional steps. They need to
organize the information or steps they developed in response to questions and
include it in the lesson plan.

Questions Were Not Encouraged (Item 42).

The instructor did not ask the soldiers if there were any questions immediately
following (or during) the demonstration. It is up to the instructor to ensure
that the demonstration has been understood. This process is started by asking
the soldiers if they have any questions. The instructor's manner and tone
should encourage questions. Under no circumstances should the instructor sug-
gest that some questions are not as valid as others or that some soldiers are
not as bright as others. All questions should be given a serious answer. If
the soldiers do not ask any questions, the instructor should verify that the
message got across by asking a few questions of the soldiers.

DEMONSTRATION/PRACTICE: Practice

THE PROBLEM. Practice, defined as hands-on performance of the task, supervised by an instructor or assistant instructor, during training, either did not happen or did not happen as it should have. Practice events are essential to skill development. No matter how good lectures, demonstrations, "talk-throughs," or "walk-throughs" are, soldiers will not learn to perform tasks unless they practice them. It is essential that, during the practice event, each and every soldier practice each and every subtask and task, until performance to the training standard under the training conditions is reached. Performance to standard must be demonstrated by the soldier at least once without assistance. This is the minimum. Research has shown that two or three successive demonstrations of task mastery by the soldier is often necessary for skill retention. Practice is so important that a separate section of this document has been devoted to it (see SECTION III, Practice).

EVIDENCE for missing or poor practice events will come from Worksheet 3, Training Observation.

Item 43. Did all soldiers practice?

*Item 44. Were soldiers initially allowed to practice subtasks in isolation from one another?

*Item 45. Was the practice on each subtask hands-on using the equipment listed in the lesson plan?

*Item 46. Were soldiers required to practice subtasks under the various conditions that they are likely to encounter on the job?

*Item 47. Did each soldier practice each subtask to standard, unassisted, before going on to whole-task practice?

*Item 48. Were the soldiers allowed to practice the task as a whole (i.e., practicing the subtasks together)?

*Item 49. Were the soldiers required to meet the overall standard in performing the entire task unassisted?

Item 50. Did a lot of soldiers have trouble with the same step during practice?

*Item 51. Was sufficient repetition allowed during practice?

Item 52. Did every soldier practice under the direct supervision of an instructor?

Item 53. Was remedial training scheduled for the soldiers who had not performed to standard during practice?

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RECOMMENDATIONS for training program modification.

All Soldiers Did Not Practice (Item 43).

All the soldiers did not practice, where practice is defined as in THE PROBLEM, above. The emphasis here is on the word "all." This is essentially a counting exercise. If there were 10 soldiers at the training site and nine of them practiced, then "all" the soldiers did not practice. When all the soldiers did not get practice, the problem is usually with the resources available for training. If there was not enough time, more time needs to be scheduled or additional training sites need to be made available. If there were not enough instructors, then more instructors are needed or more time. Whatever the resource problem may be, it has to be corrected or "all" the soldiers will not get the chance to be trained.

Subtask (Part-Task) Practice Missing or Poorly Administered (Items 44, 45, 46, and 47).

All the soldiers did not practice each subtask to standard, under the supervision of an instructor, before going on to whole task practice. The question is, "How many were not required to do this?" If 10% are not required to demonstrate proficiency during practice, then 10% are progressed in training without having the necessary skills for task performance. When, at some later time, they cannot perform on a level with their peers, the blame usually falls on them. It is not their fault. If time or resources positively prohibit all soldiers from practicing until standards are reached, then standards should be relaxed for all the soldiers, equally. This point cannot be emphasized too strongly.

Task proficiency is usually built, like a house of blocks, by fitting one subtask (block) to another until the whole is completed. Soldiers should be required to demonstrate proficiency (through practice) on meaningful parts of a task (subtasks) before progressing in training to whole task practice. If they are not proficient on the part-tasks, they will have a lot of trouble putting it all together. Soldiers will get the subtask practice they need whether or not it is a part of the training program. They will steal the time for this from whole task practice. When soldiers block during practice, or do not remember how to perform certain steps, or get the parts of one step mixed up with the parts of another step, then they have not mastered the subtasks and will force instructors to re-demonstrate subtasks and will practice them. Instructors will have to give this subtask practice or pass the soldiers on without requiring them to demonstrate whole task proficiency. Part task practice should, like whole task practice, be on the equipment specified in the lesson plan. Soldiers should practice part-tasks under the various conditions specified in the training objective or, if possible, under the various conditions they are likely to encounter on the job. These general rules also apply, of course, to whole task practice (see SECTION III, Practice, and SECTION IV, Feedback, for more guidance on practice).

<u>Whole-Task Practice Missing or Poorly Administered (Items 48 and 49).</u>

All the soldiers did not practice the task, under the training conditions, until unassisted performance to standard was reached, under the supervision of an instructor. As in part-task practice, above, the question is, "How many were not required to do this?" If 10% are not required to demonstrate proficiency during practice, then 10% are progressed in training without having the necessary skills for task performance. When, at some later time, they cannot perform on a level with their peers, the blame usually falls on them. It is not their fault. If time or resources positively prohibit all soldiers from practicing until standards are reached, then standards should be relaxed for all the soldiers, equally. This point cannot be emphasized too strongly.

Whole task practice should be the capstone training event. All of the knowledge taught by the instructors and the skills learned through demonstration and subtask practice come together in whole-task practice. It is that point in training where the task statement from the training objective is addressed fully. Whole task practice is usually conducted in training but it is not always conducted well. The principles of practice (see SECTION III) and feedback (see SECTION IV) should be used in designing and carrying out the whole task practice event. In whole task practice, each soldier should practice until performance at or above standard is reached. Soldiers should get feedback from an instructor when necessary to guide them toward task mastery. Instructors should not allow soldiers to progress in training until they have met the standard on at least one unassisted trial (two or three are better).

<u>Many Soldiers Had Trouble With The Same Step During Practice (Item 50).</u>

The problem here could be an insufficient amount of practice on that step during part-task practice, the step size in the task (the size of the step from subtask A to subtask B) may be so large that soldiers cannot figure out how to get from the previous step to this one, soldiers do not recognize the cues to which they are expected to respond (i.e., a certain amount of wear on a brake shoe is the cue to replacement), or this step was somehow left out of the demonstration and/or subtask practice. The solution to this blocking of soldier performance is a methodical conduct of a sequence of training events. Training should not progress from one event to another until the instructors are sure that the objectives of that event have been met. A block at this late stage in training means that soldiers were progressed in training without having demonstrated the prerequisite proficiencies. The solution to a block during whole task practice cannot be an action restricted to this event. The training process leading to this point must be investigated to ensure that the following steps are followed. Bypassing any one of them may lead to this problem.

Prerequisite skills and knowledge must be checked and remedial training given if soldiers do not have the necessary skills/knowledge.

Soldiers must demonstrate that they know the terms and concepts associated with task performance.

Soldiers must demonstrate that they can perform each subtask to standard (see items 44-47, above).

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Soldiers must be guided (through demonstration and feedback) through the process of putting the subtasks together into a smooth whole task performance.

Soldiers Were Not Given Enough Practice (Item 51).

Soldiers were not given enough practice if each and every soldier did not practice each and every subtask and task until he or she could demonstrate proficiency to standard, under the training conditions, at least once without assistance. No soldier should be allowed to progress in training without having satisfied the training objective. Novel or difficult tasks may require more than one demonstration of proficiency. If soldiers do not seem to retain task proficiency for very long, two or three successive demonstrations of task proficiency in practice may be necessary. The solution to this problem lies in providing the training resources and/or time for this to happen.

Some Soldiers Practiced Without An Instructor Present (Item 52).

Some soldiers practiced subtask or task performance without being directly supervised by an instructor. Instructors must be available to provide demonstrations when necessary, point out cues and critical discriminations, provide feedback, and keep the soldier from practicing incorrect actions. Soldiers learn what they practice (see SECTION III). They learn incorrect actions just as readily as correct ones. No soldier should practice unless he or she is under the direct supervision of an instructor.

No Remedial Training Was Scheduled For Poor Performers (Item 53).

Soldiers who did not perform to standard were not scheduled for remedial training. Practice cannot go on forever. There will usually be some soldiers who do not master the task in the time allotted. This should be a small number of soldiers. Less than 10%. Since the purpose of training is to train everyone, additional training must be scheduled for those soldiers who could not perform to standard during regularly scheduled practice. This additional training must not only be scheduled, it must be given, and it must be given in accordance with sound training guidance. Last minute, behind the barracks brush-ups to enable soldiers to pass tests will only do just that, get soldiers to pass tests. This kind of training does not lead to retention of skills/knowledge.

DEMONSTRATION/PRACTICE: Feedback

THE PROBLEM. Soldiers were not told if they were performing the subtasks/tasks correctly or incorrectly, during practice. During the early stages of training, soldiers need to be guided during task practice by having an instructor tell them when they have just made an error or tell them that they are performing correctly. This "feedback," accompanied by demonstrations and additional training to correct faulty performance, should occur during task practice. Feedback following task performance, during a critique, will not correct faulty performance. See SECTION IV, Feedback.

EVIDENCE for poor or missing feedback during practice will come from Worksheet 3, Training Observation.

> Item 54. Were soldiers told what they were doing right or wrong <u>during</u> practice?
>
> *Item 55. Was feedback provided as soon as possible following actions?
>
> *Item 56. Was feedback specific to actions and free of ridicule?
>
> *Item 57. Was faulty performance identified and corrected?
>
> *Item 58. Was the amount of feedback given a soldier gradually reduced as the soldier progressed?

RECOMMENDATIONS for training program modification.

Soldiers Were Not Told What They Were Doing Right/Wrong During Practice (Items 54 and 55).

Soldiers were not given feedback, during practice, as soon as possible following their actions. Soldiers learn what they practice. It is important, then, that they practice correct performance at all times. All soldier performance should be monitored by an instructor to ensure that soldiers are practicing correct performance. Since soldiers may have no clear memory a few seconds later of how they responded, soldier errors should be corrected as soon after they occur as possible. Encouragement should be given during error-free performance to reinforce and "lock in" this performance. This necessary interaction between the soldier and the instructor must take place while practice is going on. Post-practice critiques will not correct faulty performance and do not "lock in" correct performance very effectively.

Feedback Was Not Action Specific And Ridicule Free (Item 56).

Feedback to the soldiers was not specific to their actions and/or was not free of ridicule. Feedback should be specific to the action. If feedback is supposed to let a soldier know whether he or she is right or wrong, the soldier must be able to tell <u>which</u> action is right or wrong. If all actions are correct, of course, telling a soldier that the entire task was performed correctly also says that each action was correct. But if errors occur, a general

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statement that the soldier "did it wrong" does not tell the soldier what actions must be corrected. The soldier needs to know <u>what</u> was right and <u>what</u> was wrong. In addition, this feedback to the soldier should encourage his or her efforts. Soldiers are seldom motivated by being "put down." Instructors should focus on the actions they are correcting, not the person performing the actions.

Faulty Performance Was Not Identified And Corrected (Item 57).

Soldier performance errors were not identified and corrected by an instructor. Soldier performance during practice should be closely monitored by an instructor so that performance errors are identified and corrected as they occur. Soldiers should not be permitted to progress in training until error-free performance is demonstrated.

Feedback Was Not Reduced As Soldier Performance Improved (Item 58).

The amount of feedback given soldiers was not gradually reduced as soldiers progressed. In the early stages of training, when soldiers are just learning the task steps and how they fit together, they need a lot of feedback to focus their attention on what to do and how to do it and to help them avoid inappropriate and incorrect actions. As they learn for themselves what to do and what not to do, they get better at knowing when they are performing correctly and when they are performing incorrectly. They develop their own feedback. As they get better and better at task performance, and demonstrate this ability to decide for themselves whether they are performing right or wrong, instructors should provide less and less feedback. If instructors do not reduce the amount of feedback, soldiers will continue to rely on the instructor's judgment instead of developing their own.

DEMONSTRATION/PRACTICE: Job Aids

THE PROBLEM.   Job aids were not an integral part of training. If job aids
exist for a task, they should be given to the soldiers at the beginning of
training, used actively during the training, and should be accurate. Training
should focus more on the use of the job aid than on task performance without
benefit of the job aid.

EVIDENCE for job aids not being an integral part of training will come from
Worksheet 3, Training Observation.

   Item 59.   Were job aids given to the soldiers at the <u>beginning</u> of training?

   *Item 60.   Did the instructor require the soldiers to use job aids as pre-
               scribed in the lesson plan?

   *Item 61.   Did the job aids appear to be accurate and beneficial to the
               soldiers?

RECOMMENDATIONS for training program modification.

<u>Job Aids Were Not An Integral Part Of Training (Items 59 and 60).</u>

Job aids were not introduced as an integral part of instruction. If a job aid
for this task currently exists but was not made an integral part of training,
the training program should be revamped to focus on this job aid. The training
process should be such that the primary emphasis is on the job aid rather than
task completion. After the initial terms and concepts needed to use the job
aid to perform the task are mastered by the soldiers, the demonstration and
practice events should aim toward making the soldiers masters of the job aid.
The test, too, should be on using the job aid to perform the task. The most
useful examples here are in the maintenance area. Maintenance personnel should
be taught to use the manuals and associated tools to repair/replace equipment
rather than being taught to perform the repair/replace functions only. This
requires that each soldier be given a job aid at the beginning of training
which is his or hers to keep and to annotate as deemed necessary by the soldier.

<u>Job Aids Were Inaccurate And/Or Of Little Help To The Soldiers (Item 61).</u>

Job aids were inaccurate and/or were not of much help to the soldiers. If this
happened, it is obvious that new job aids are needed. Until these job aids are
produced, training is probably better off without them.

DEMONSTRATION/PRACTICE: Progression of Training Events

THE PROBLEM. The sequence of training events did not progress from a lecture (to provide enabling knowledge -- the terms and concepts needed for task performance) to a demonstration, and from the demonstration to practice. Training should follow this sequence.

EVIDENCE for an improper training progression will come from Worksheet 3, Training Observation.

>   *Item 62. Did the training events progress from lecture to demonstration
>   to practice?

RECOMMENDATIONS for training program modification.

Training Did Not Progress From Lecture To Demonstration To Practice (Item 62).

Training did not progress as it should have. The first training event in a lesson, after the introduction, should be a lecture where the terms and concepts needed to understand and talk about task performance are given to the soldiers. When these terms and concepts have been grasped by the soldiers, then the subtask or task should be demonstrated. When the soldiers understand what occurred during the demonstration, then they should practice subtask or task performance until they meet the proficiency requirements of the training objective. Training may actually cycle through the lecture-demonstration-practice sequence for each subtask or step separately before being repeated for whole task training.

GENERAL OBSERVATIONS: Implementation of Training Plan

THE PROBLEM.   The training that was actually conducted,was not a faithful im-
plementation of the training (lesson) plan. The lesson plan should lay out the
training activities to be completed in enough detail for any instructor-trained
subject matter expert to follow. The instructor should follow this "prescrip-
tion" for training this task. Procedures for modifying poor training prescrip-
tions (lesson plans) can be found in the Job Aid for the Systematic Evaluation
of Lesson Plans, Research Product 81-15, which is a part of the TPE set of re-
search products (see page 1).

EVIDENCE for an unsound implementation of the training plan will come from
Worksheet 3, Training Observation.

    *Item 63. Did the instructor follow the lesson plan?

     Item 64. Were training aids and training materials called for in the
               lesson plan actually used?

     Item 65. Did the instructor follow the sequence on the training plan
               worksheet?

    *Item 66. Was the instructor's presentation well organized?

    *Item 67. Were basic rules and standard procedures presented before
               exceptions?

    *Item 68. Were critical discriminations emphasized?

    *Item 69. Did the training focus on how to do something rather than talk-
               ing about what to do?

     Item 70. Were soldiers sometimes standing around with nothing to do dur-
               ing training?

    *Item 71. Did the instructor seem to have enough time to conduct the
               training as planned?

     Item 72. Did the instructor give a summary?

RECOMMENDATIONS for training program modification.

Training Did Not Follow The Lesson Plan (Items 63 and 64).

The instructor did not follow the training "prescription" detailed in the
lesson plan. It is assumed that the lesson plan provides a good training
prescription as defined in the Job Aid for the Systematic Evaluation of Lesson
Plans. If it does not, then the lesson plan itself needs to be rewritten. The
instructor should follow the lesson plan. If he or she feels that the lesson
plan is inaccurate or does not provide good training, then he or she should
take steps to have the lesson plan modified. The solution to an inaccurate

lesson plan is not to just stop following it. If the instructor has difficulty
following the lesson plan because he or she has not been "trained to train,"
instructor training should be immediately scheduled.

If the audiovisual materials, charts, mock-ups, handouts, manuals, or other
training aids or equipment called for in the lesson plan were not used, find
out if they were available. These materials should be collected and checked
out by the instructor 24 hours in advance. If they are not available to the
instructor, and will not be available in the future, the lesson plan should be
revised. Any materials that are inaccurate should be eliminated from the lesson
plan or revised.

Training Was Poorly Organized (Items 65 and 66).

The sequence on the Training Plan (Worksheet 1) has been derived from the
lesson plan. The instructor should follow this sequence. If he or she be-
lieves this sequence to be poor, he or she should have the lesson plan changed.
Failure to follow the lesson plan sequence because of personal preference is
not acceptable. Instructors usually have considerable freedom to structure
training around the lesson plan sequence. If this structuring has caused
soldiers to have trouble following the drift of the lesson, the instructor will
have to check his organization with training developments personnel.

Basic Rules Were Not Presented Before Exceptions (Item 67).

Basic rules should be presented before exceptions. When exceptions are pre-
sented first, soldiers expend a lot of energy trying to figure out what the
basic rule is. When basic rules are presented first, soldiers learn more
efficiently.

Critical Discriminations Were Not Emphasized (Item 68).

Critical discriminations must be emphasized in training since they provide the
basis for action vs. no action or action A vs. action B. Remember that knowing
how to change a brake shoe is only half the task. The soldier must also know
when to change the brake shoe. When performing the task on the job, soldiers
must know when to initiate task performance (what cues lead to this decision)
and, perhaps, which of several courses of action to take (what are the cues
that cause the soldier to take one course of action over another). These bases
for making judgments (knowing when the brake show is worn/change – not worn/do
not change; or when the target is a tank/fire main gun – truck/fire .50 cal –
troops/fire coaxial machinegun) are critical discriminations. Instructors
should emphasize these discriminations by calling them to the attention of the
soldiers, identifying them as a separate subtask or step, demonstrating the
various cues by giving examples that the soldiers can actually see, and making
the soldiers practice making the discriminations during the practice event.
Critical discriminations should also be identified in the lesson plan.

Tasks Were Talked About More Than They Were Performed (Item 69).

The instructional activity that occurred during training was primarily "talking
about" task performance rather than "doing" the task. Training is supposed to

be performance based. Soldiers enter training unable to "do" the task. If they could perform the task, training would be unnecessary. During training they engage in instructional activities designed to build the skills and knowledge necessary for task performance. They learn to "do" the task by practicing it in the training environment. When training is over, the soldiers are tested to see if they can "do" the task. If the instructional activities do not require the soldiers to perform the task to at least one correct trial, then training is not performance based. If the training does not focus on "doing" something, bring this problem to the attention of the training developer since this lesson will need to be redesigned.

Soldiers Were Idle During Training (Item 70).

Soldiers were seen standing around with nothing to do during training. Training time is a high cost item and should be used as efficiently as possible. Training should be structured so that soldiers are occupied at all times. The only soldiers that should be unoccupied are those that are on a break. If the training site has been set up in such a fashion that not all the soldiers can be trained at one time (resource limitations), then concurrent training stations need to be established. For example, if there are five pieces of equipment to train on, an assistant instructor at each, and five soldiers at each training station, but only one soldier can be trained at a time, it would be better to make one training station a concurrent station. That way, instead of having 20 soldiers idle while five soldiers train, all 25 soldiers would be training. By whatever means available, all soldiers should be training.

There Was Not Enough Training Time (Item 71).

There was not enough time in the schedule to cover all the material in the lesson plan. The time scheduled for a lesson should allow an introduction, lecture(s), demonstration(s), and enough practice trials to bring all but a very few (certainly no more than 10%) soldiers to standard on all subtasks and tasks. This should all be accomplished at a pace that the soldiers can maintain. If there are no obvious inefficiencies (see paragraph immediately above for an example), enough time should be allotted for these training events. If these training events do occur, but training time is not efficiently utilized, these inefficiencies have to be solved before addressing the time problem.

No Summary Was Given (Item 72).

The instructor did not wrap up the lesson with a summary. Summaries serve the purpose of refreshing the soldiers mind on what was just taught, give some idea of what the important points were, and put the lesson into a short, more easily remembered, framework. All lessons should end with a summary.

GENERAL OBSERVATIONS: Training Aids

THE PROBLEM. The training aids were inaccurate, confusing to the soldiers, or were not used effectively during the instruction. Training aids only have one purpose, to enhance instruction. If they do not enhance instruction, either the aids themselves or the instructions for their use should be changed. Note that the focus here is on training aids, not job aids. Job aids are covered under DEMONSTRATION/PRACTICE, items 59-61.

EVIDENCE for the ineffective use of training aids will come from Worksheet 3, Training Observation.

    *Item 73. Did the instructor use the training aids effectively?

    *Item 74. Were the training aids accurate?

    *Item 75. Did the training aids seem to confuse the soldiers?

RECOMMENDATIONS for training program modification.

Training Aids Were Not Used Effectively (Item 73).

Training aids may be accurate and well constructed but they will not enhance instruction unless they are used effectively. Guidelines for the use of the aids should be in the lesson plan. Instruction in how to follow the guidelines should have been part of the Instructor Training Course that all instructors should have attended. If guidelines are missing, they should be added. If instructors have not attended an Instructor Training Course, they should be scheduled at the earliest possible time. These actions should result in the training environment being set up so that all soldiers have a clear and unobstructed view of the aids, aids that fit with the other training materials and the instructional presentation, an instructional sequence that introduces the aid at the time the soldier needs it to do or understand something, aids that work properly and represent the concept or equipment correctly, aids that are designed for easy soldier understanding, etc. It is not the purpose of this paragraph to detail how training aids should be designed and constructed. Problems alluded to here should be described to training development and/or instructor training personnel.

Training Aids Were Not Accurate (Item 74).

Training aids did not accurately reflect task requirements (equipment, reporting formats, job actions, etc.). Inaccurate training aids confuse the soldier and undermine their confidence in the instructional staff. The solution here is simply to have the training aids revised. Necessary changes should usually be known about in ample time to get them made before the existing aids become inaccurate.

Training Aids Seemed To Confuse The Soldiers (Item 75).

Soldier questions and comments indicated that they were confused by the training aids. Such confusion can arise when the aid conflicts with something the

soldier is used to or has seen before, when the training aid does not fit in well with the instructional sequence, when the aids do not work properly, etc. The over-riding rule here is that a training aid only has one real purpose, to provide the soldier with something he can experience directly so that instruction goes beyond "talking about" task performance. If a training aid does not aid soldier learning, the aid and/or instruction need to be redesigned.

GENERAL OBSERVATIONS: Instructor Performance

THE PROBLEM. For one reason or another (see items below), instructors did not demonstrate a good grasp of how to conduct effective training. Since the instructor is usually the medium through which the information and guidance flows to the soldier, attention is rooted on the instructor. Small (and large) flaws in presentation technique stand out and can destroy the positive training benefits of well designed training. All instructors should have attended an Instructor Training Course. Any who have not should be scheduled to attend such a course as soon as possible. Subject matter expertise will not compensate for a lack of skill in training delivery.

EVIDENCE for substandard instructor performance will come from Worksheet 3, Training Observation.

   *Item 76. Did the instructor move smoothly from one learning activity to the next?

   *Item 77. Did the instructor emphasize what the soldiers need to know?

    Item 78. Did the instructor include material that is not in the lesson plan?

   *Item 79. Did the instructor minimize unnecessary detail and refrain from telling unrelated war stories?

   *Item 80. Were soldiers encouraged to actively participate (i.e., questioning, discussing, performing) during training?

    Item 81. Did the instructor ask the soldiers if they had any questions during lecture, demonstration, and practice?

   *Item 82. Did the instructor set a tone which encouraged soldier questioning?

    Item 83. Did the instructor answer the soldier's questions?

   *Item 84. Did the instructor answer all the soldier's questions?

   *Item 85. Did the instructor answer all the soldier's questions to their satisfaction?

   *Item 86. Did the instructor use class time efficiently?

   *Item 87. Did the instructor show a positive attitude toward the training and the soldiers?

RECOMMENDATIONS for training program modification.

The Instructor Did Not Move Smoothly From One Learning Activity To The Next (Item 76).

Instruction should move smoothly from one learning activity to the next to avoid soldier confusion and to keep soldiers from constantly having to figure

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out the connection between events. They will figure these connections out, of course, but will not be as attentive to instruction for the first few minutes as they would have been given smooth transitions. Instructional sequences should be designed so that, at all times, the soldier knows what has just happened and why, what is happening now and why, and what will come next and why. The instructor should facilitate the development of this sense of continuity in the soldiers by helping the soldiers bridge the gaps where one learning activity stops and the next begins. This is most easily done by ending each learning activity with a short summary statement that makes the connection between the activity and the next activity and ensuring that soldiers are not required to do anything between learning activities that would hamper e_ *y transfer from one situation to the next.

<u>The Instructor Did Not Follow The Content And Emphasis Guidelines From The Lesson Plan (Items 77, 78, and 79)</u>.

Soldiers cannot learn everything that is presented to them during a course of instruction so they need help in determining what is important and what is not important. Not all statements made by an instructor are equally important. Some subtasks or steps are more critical than others. Instructors should highlight critical subtasks and steps for the soldiers by emphasizing the "need to know" and minimizing the "nice to know," by minimizing extra material that the instructor may think is necessary but which is actually not a part of the lesson, and by refraining from telling "stories" that do not relate directly to the subtask or task being learned. Instructors should have been cautioned about this during the Instructor Training Course. This point needs to be repeated often and instructors observed periodically, however, because projecting your own sense of what is important and using the podium to establish your credentials as an "expert" are normal human tendencies. Instructors will engage in these activities without being aware of it. Even very highly trained instructors need to be cautioned on this every now and then. Beware of the argument that "stories" motivate soldiers and relax the training atmosphere. They may and they may not. In any event, story telling should be confined to breaks.

The argument that instruction was added or deleted to conform to current reality should be pursued with the instructor. Sometimes equipment changes, doctrine changes, new or changed publications (TMs, FMs, etc.), new training guidance, etc., will have forced a modification to the lesson plan that, because of time constraints, has not been made. Instructors may be aware of these changes and may have already changed the actual instruction. If this has happened, press the training developer to make the changes on the lesson plan as soon as possible.

<u>Soldier Questioning Was Not Encouraged (Items 80, 81, 82)</u>.

Soldiers generally prefer to be passive learners. In many ways this is reasonable given the world of television, the passive nature of public instruction today, and the use of so many films and slide presentations during military training. Training, however, cannot be a passive enterprise for the soldier. Skills are developed through active participation. Instructors should build an

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atmosphere that encourages participation by being candid, friendly, non-critical, and eager to help soldiers learn and master tasks. All criticism should be positive and aimed at task performance rather than negative and aimed at the soldiers (it is the task performance that is substandard, not the soldier). If soldiers are not asking questions, the instructor should not assume that he or she is being understood. The instructor should ask for questions. If none are offered, the instructor should ask the soldiers questions to make sure they are keeping up.

Soldier Questions Were Not Answered To The Soldier's Satisfaction (Item 83, 84, 85).

All soldier questions should be answered to the satisfaction of the questioner (provided the question is related to the issue at hand). Soldiers expect all instructors to be subject matter experts. When instructors cannot answer questions, soldier confidence in instructor expertise is undermined. Questions should be answered when they are asked since they signal a block to soldier understanding. Continuing instruction without answering the question just leaves that soldier behind. It probably leaves other soldiers behind, too, because it is seldom only the soldier who asks the question who is confused.

Find out if the instructor is really a subject matter expert. If the instructor did not know the answers to soldier questions, then he or she may not be qualified to teach this lesson. This should be brought up with the instructor's superiors. If the instructor is really a subject matter expert and just did not realize how important it is to answer all soldier questions to their satisfaction, then suggest that the instructor get remedial training on "how to train."

Class Time Was Not Used Efficiently (Item 86).

Class time is a precious commodity and should be spent as carefully as possible. There usually is not enough time for effective training anyway given the pressures to cut training budgets. Inefficient use of class time includes such things as: soldiers standing around waiting to practice instead of being at concurrent training stations, class time being used to set up or adjust training equipment, class time being used to distribute training materials which should be already in the hands of soldiers, breaks that come too often or are too long, stopping training early (because it is a nice/bad day, tomorrow will be hard/easy, there is an inspection/day off coming, etc.) despite the fact that not all soldiers have demonstrated proficiency to the training standard, etc. If class is in session, all soldiers should be gainfully occupied.

Inefficient use of class time usually reflects a lack of control over training by training management personnel and/or a training design that does not provide sufficient guidance for the instructor. If there are no concurrent training stations, and they are needed, bring this to the attention of the training manager since setting up these stations will require additional resources. If the resources are not available, training will have to be re-designed. If the problem is one over which the instructor has direct control, such as equipment set up, breaks, early dismissal, etc., it may be that the instructor is not as

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keenly aware of the impact of inefficient class time on costs and soldier proficiency as he or she should be. In this instance, instructors need to be trained and training managers need to be prompted to exercise more on-the-ground control over the training process.

Instructor Attitude Not Positive (Item 87).

Instructors should exhibit a positive attitude, at all times, toward the training, themselves, and the soldiers. Instructors should not use the podium to launch their personal beliefs about the state of the Army, the quality of soldiers today, pay and allowances, readiness, combat capabilities of units and items of equipment, instructional objectives/sequence/organization, training materials, job aids, or anything else. The instructor is the model that the soldiers are expected to follow. This model should be positive. Instructors that do not display a positive attitude should be cautioned about this by the training manager. Continued demonstration of a poor attitude by an instructor, no matter how friendly, entertaining, or technically proficient, should be cause for seriously considering removal from instructor duties.

GENERAL OBSERVATIONS: Training Duration

THE PROBLEM. Actual training time was shorter or longer than the time allotted.
In theory at least, training time has been carefully determined by training
developments personnel through pilot trials of the program using typical train-
ing input. Instructional event times have been designed to bring a certain
percentage (perhaps 90-95%) of the soldiers to standard. Longer times may be
justified by large classes or classes that do not show proficiencies on pre-
requisite tasks. Shorter times can only be justified when all soldiers have
met the standard before allotted time ran out.

EVIDENCE for a training duration different from that allotted will come from
Worksheet 3, Training Observation.

    Item 88. Did the class sessions start and end on time?

    Item 89. Was the actual training time somewhat shorter or longer than
              the time allotted?

RECOMMENDATIONS for training program modification.

Training Time Shorter/Longer Than Time Allotted (Items 88 and 89).

Training time should not be curtailed or stretched without good reason.
Training time has been designed to allow most of the soldiers to become task
proficient and demonstrate this to themselves and the instructor. It is often
curtailed for the silliest of reasons. You will have to ask the training ob-
server how much shorter/longer training was or how badly start/stop times were
missed. With this information in-hand, you can go to the instructor to find
out why this happened. If all soldiers demonstrated proficiency before time
was up, additional practice to create above standard performance seems more
reasonable than free time. If time was up and only half the soldiers were pro-
ficient, more time seems reasonable (but the reason for this poor showing needs
to be explored).

TESTING: Test Instructions

THE PROBLEM. The instructions given to the soldiers at the beginning of the test were not clear enough so that the soldiers could easily understand what they were expected to do and how well they were expected to do it. Test instructions and pass/fail standards must be clearly presented to the soldiers.

EVIDENCE for ambiguous instructions or pass/fail standards will come from Worksheet 4, Testing Observation.

> Item 90. Did the examiner read the test instructions directly from the lesson plan?

> *Item 91. Were the test instructions stated clearly enough for the soldiers to know what they were expected to do?

> Item 92. Were pass/fail standards provided to the soldiers?

> *Item 93. Were pass/fail standards clearly explained such that soldiers would know when they performed correctly?

RECOMMENDATIONS for training program modification.

Test Instructions Were Not Clear (Items 90 and 91).

Test instructions get the soldier in the right mental frame of reference. To do this, they have to be crystal clear to the soldiers. They should also get each soldier into the same mental frame of reference. To do this, they have to be given to each soldier in exactly the same way. This is why test instructions are standardized and are written down for the examiner to read. The examiner should read these instructions, just as they are written, for each soldier. If the soldiers did not seem to understand what was required of them after hearing the test instructions, then the instructions themselves may need to be rewritten. Test instructions should tell the soldier what he or she will have to do, what cues they will have to know to determine when to start, the conditions they will have to perform under, the equipment/tools they will have and can use, how much time they will have, and the standards for successful completion of the task. Any rewritten instructions should be tried out on a couple of soldiers that are typical of normal input to training.

Pass/Fail Standards Were Not Clear (Items 92 and 93).

A trained soldier is one who knows when his or her performance has been at or above standard. They are not dependent on an outside judgment for this. To do this, the soldiers need to know what the standards are. They should not be surprised at the standards since they should be the same as they were at the last practice event. Soldiers should be given the standards for a task before testing on that task begins. The standards should be expressed in such a way that the soldiers can easily translate what they hear into specific times and accuracy levels for specific actions on their part. If this interpretation or translation is difficult, standards should be rewritten and tried out until

they are easily understood by the soldiers. In keeping with this general rule, then, a standard that is expressed, "In accordance with the requirements of the TM (or some other manual)", is only acceptable when the appropriate pages and paragraph numbers are included in the standard.

TESTING: Test-Training Match

THE PROBLEM. The test was not a good measure of the training objective. That is, it was not a good measure of the extent to which the training program provided soldiers with the skills and knowledges necessary to perform the required tasks to standard. The purpose of a training program is to bring everyone to proficiency on the tasks in the training objectives. The purpose of the test is to determine if the soldiers are actually proficient on the tasks in the training objectives. If the test tasks, conditions, and standards do not match the training tasks, conditions, and standards, there is no way of knowing if the training program has actually brought the soldiers to proficiency.

EVIDENCE for a test-training mismatch will come from Worksheet 1, Training Plan, and Worksheet 4, Testing Observation.

> *Item 94. Did the test occur soon after the completion of training?
>
> Item 95. Were all tasks specified in the training objectives tested?
>
> Item 96. Were soldiers tested on any tasks that were not taught?
>
> *Item 97. Were the testing conditions the same as the training conditions?
>
> *Item 98. Were the standards specified in the training objectives used to score test performance?

RECOMMENDATIONS for training program modification.

The Test Did Not Occur Soon After The Completion Of Training (Item 94).

Testing to determine if training has brought soldiers to proficiency should be done as close in time to the training as possible. This is not always administratively feasible, however. The best sequence is; train A, test A, train B, test B, train C, test C, and then give a post-training comprehensive test on A, B, and C. The individual task test shows how well the soldiers are doing and how well the training program is doing in bringing the soldiers to proficiency. The comprehensive test shows what proficiencies the soldiers have as they leave training. Individual task tests should come as soon after training as possible. Delays for administrative convenience should be avoided where possible. When testing is delayed, some reduction in proficiency should be expected. When comprehensive tests are used to measure training program effectiveness, soldier proficiencies should be expected to be lower than they were on the individual task tests.

Tasks Tested Were Not The Same As Tasks Trained (Items 95 and 96).

The task statements in the training objectives should determine what is trained and what is tested. Consequently, tasks trained and tasks tested should be the same. Sometimes, through oversight or administrative problems in conducting training, tasks are left out of training. When this happens, those tasks should not be tested until the training can be made up. Sometimes,

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tasks are trained but not tested. If a task is important enough to train, it is important enough to test. In either case (tasks trained but not tested or tasks tested but not trained), training and/or testing should be brought in line with the objectives. If the objectives are wrong, they should be changed.

Testing Conditions Were Different From Training Conditions (Item 97).

The conditions statement in the training objective should determine the conditions for both training and testing. Consequently, the conditions for the training and testing should be the same. If the problem is that the correct training or testing conditions cannot be set up for some reason, find out why. If materiel and/or facilities required by the lesson plan exist but are not available or cannot be guaranteed, suggest that training and testing be redesigned for materiel and/or facilities that can be guaranteed. Beware of impossible conditions, i.e., "NBC" conditions, that cannot be reproduced. Such conditions are essentially "no" conditions since they cannot be generated. If the test conditions are more difficult than the training conditions, poor soldier performance is probably more a function of conditions than soldier learning (since the soldiers have not had a chance to practice under these conditions). If the test conditions are easier than the training conditions, poor soldier performance under these easier conditions almost guarantees poor soldier performance under the more difficult conditions of training. In either case (test conditions easier or harder than training conditions), the test and/or training conditions should be brought in line with the objectives. If the objectives are wrong, they should be changed.

Test Standards Were Different From Those In The Training Objectives (Item 98).

First, if the standard, as written in the training objective, is not clear, missing, or does not specify "how well" the soldiers must perform, it needs to be rewritten. The standard must specify clearly and specifically how well the soldier must perform to be a GO. The standard must have real meaning for the soldiers. It must be communicated to them, and written in the lesson materials, in words that they understand and can use to judge their own performance. This standard, then, should be used in the final stages of practice (it is the standard the soldier must meet in practice) and in the test. If the training and testing standards are not the same, the test and/or training standard should be brought in line with the objectives. If the objectives are wrong, they should be changed.

TESTING: Test Realism

THE PROBLEM. The test did not accurately reflect, as closely as possible, the requirements and conditions of the job. The test, of course, is directly related to the training objectives. The training objectives, however, should specify the tasks and conditions in such a manner that the job requirements are reproduced as accurately as possible within the training environment. Such training objectives will guarantee job related testing so long as the test follows the objectives closely.

EVIDENCE for a lack of test realism will come from Worksheet 4, Testing Observation.

   *Item 99. Were critical decisions and difficult actions required on the job omitted from the test?

   *Item 100. Were critical discriminations included on the test?

   *Item 101. Did the test come as close as possible to measuring performance as it would occur under actual job conditions?

   *Item 102. Did t   r it require that soldiers perform tasks together that must b. rformed as a unit on the job?

RECOMMENDATIONS for training program modification.

Critical Decisions/Difficult Actions Not On Test (Item 99).

Critical decisions and/or difficult actions appropriate to the level to which the soldiers are being trained should be a part of the test. These are often not included on tests because 1) they are hard to train to standard and instructors often doubt the ability of soldiers to demonstrate proficiency and 2) they are hard to test. They should be included on the test, however, exactly for these reasons and because the test cannot measure program success and soldier mastery of the training objectives if the critical decisions and/or difficult actions are omitted.

Critical Discriminations Not On Test (Item 100).

All the critical discriminations included in the training program should also be included in the test. Remember that there are four parts to performing any task; 1) knowing when action is/is not required, 2) knowing which actions (of several) are required in this case, 3) performing the required actions correctly and to standard, and 4) recognizing that actions being performed are correct and to standard. The bases for deciding when action is/is not required or which actions (of several) to take in this case are the critical discriminations. They are often not included on tests because they are hard to set up. A true test of the training objectives will require the inclusion of all specified critical discriminations. All such discriminations should, therefore, be included on the test.

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<u>Test Requirements/Job Requirements Different (Items 101 and 102)</u>.

The test should, as closely as possible, measure performance as it would occur under actual job conditions and should require soldiers to perform tasks together that would be performed together on the job. This says that the test should approximate job requirements. The extent to which this can be done may be limited by resource constraints, but such constraints can often be overcome with a little ingenuity. You will have to get with the training observers to find out why they checked these items (101 and/or 102). Take their observations to the training developer to see if a more realistic test can be developed.

TESTING: Contamination

THE PROBLEM. Soldiers received help during the test in the form of hints, prompts, or cues from the examiner and/or the standards from the training objectives were not applied consistently and objectively to all the soldiers. The test should be a measure of how well soldiers can perform tasks without any help from outside sources. The soldiers should be on their own during the test and should be evaluated against the standards from the training objective. Each soldier should receive exactly the same test and should be evaluated against exactly the same standards.

EVIDENCE for contamination in test scores will come from Worksheet 4, Testing Observation.

Item 103. Did the same person act as both examiner and instructor?

Item 104. Did the examiner help the soldiers in any way during the test?

*Item 105. Did the examiner apply the standards specified in the training objectives consistently and objectively?

*Item 106. Did the soldiers receive artificial cues or help during the test?

RECOMMENDATIONS for training program modification.

Instructors and Examiners Were The Same Persons (Item 103).

The person who trains a task should not test it. Resources permitting, instructors and examiners for a task or lesson should be different people. The instructor's job is to bring everyone to mastery. The examiner's job is to dispassionately measure soldier performance. There is a thing called a "leniency bias." Instructors have a lot of it. It makes them tend to see right answers whenever the correctness of an answer (or action) is doubtful. This is usually an unconscious tendency but a consistent one. Much truer measures of soldier proficiency are obtained from examiners with less "leniency bias." As a general rule, examiners should not have had a role in training.

Soldiers Got Help From Examiners (Items 104 and 106).

That soldiers should not get help from the examiners seems obvious, but it happens. Examiners are not always committed to rigorous measurement of soldier performance. If rigorous measurement is not required by training management personnel, it will not be exercised by test examiners. If examiners are also the trainers, they will probably not be able to be rigorous testers because of "leniency bias" (see paragraph immediately above). If examiners are not rewarded for rigorous testing (they may even be punished if too many soldiers fail), they will not be strict in their interpretation of their role. If soldiers are getting help from examiners, you will have to find out why the examiners are doing this. If they do not realize what they are doing, they need training in test administration. If the problem lies with the attitudes

of training management, you can try to solve this at the next higher level in the chain of command if that is feasible from your position. If you work for the training manager, you may be stuck on this one. You will have to tailor the correction to the reason.

Specified Standards Were Not Consistently Applied (Item 105).

The GO/NO GO standards for the test should derive directly from the training objectives and should be applied consistently and objectively to all soldiers. Each soldier should be evaluated against the same standards. Standards should not be modified for any reason unless they are modified equally for all soldiers and this modification is documented in the lesson plan and the training developer, trainers, soldiers, training command, and gaining units are all informed of the change. Inconsistent application of standards results in uninterpretable test scores. When standards have been inconsistently applied, the resulting test scores should not be used. As in the paragraph immediately above, you will have to figure out why the examiners did what they did and suggest the appropriate correction.

TESTING: Feedback

THE PROBLEM. Soldiers were not given feedback on their test performance. Soldiers should be told, specifically, what they did right and what they did wrong on the test. This feedback should be given as soon as possible after the test has been completed.

EVIDENCE for a lack of feedback will come from Worksheet 4, Testing Observation.

 Item 107. Were soldiers told what they did right and wrong on the test?

 *Item 108. Was feedback given as soon as possible after the test?

 *Item 109. Was feedback specific to the soldier's actions and free of ridicule?

RECOMMENDATIONS for training program modification.

Soldiers Were Not Given Feedback (Item 107).

Soldiers should not leave a test site wondering what they did right and what they did wrong. They should know this in considerable detail. Examiners should go over test performance with the soldier, covering each subtask, telling the soldier if the subtask was performed to standard, or not to standard. Substandard performance should be gone over in detail. Time for this should be included in the testing schedule. Time problems need to be addressed to the agency controlling the training schedule. If feedback was not given even though time permitted, examiners should be given training on sound test administration procedures.

Feedback Was Delayed Following The Test (Item 108).

Feedback giving knowledge of test results and correcting faulty performance should be given as close to the actual test performance as possible. Soldiers should be told what they did right and what they did wrong as soon as the test is over. Delays for administrative convenience should be avoided. If time has not been scheduled for feedback immediately following the test, have the agency controlling the training schedule add time for this requirement.

Feedback Was Not Specific/Ridicule Free (Item 109).

To be useful to the soldier, feedback must be specific to the soldier's actions (at subtask level). Feedback must reinforce correct actions and modify incorrect actions as well as reinforce/modify soldier knowledge. Feedback that is not specific may reinforce correct actions/knowledge but it will not effectively modify incorrect actions/knowledge. Feedback must also be free of ridicule. The examiner should comment on soldier's actions and their knowledge, not on attributes of the soldiers themselves. Remember, it is the action that is slow/below standard, not the soldier. Examiners giving non-specific and/or degrading feedback should be given training on sound test administration procedures.

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SECTION VII

JOB AIDS FOR THE VARIOUS STEPS OF ISD*

PHASE I. ANALYSIS

I.1 Analyze Job

I.2 Select Tasks/Functions

Schulz, R. E. Job aid for selecting tasks for training. Human Resources Research Organization, Alexandria, VA, Sep 78.

I.3 Construct Job Performance Measures

Schulz, R. E. Job aid for conducting task analysis. Human Resources Research Organization, Alexandria, VA, Sep 78.

I.4 Analyze Existing Courses

Schulz, R. E. Job aid for analyzing existing courses. Human Resources Research Organization, Alexandria, VA, Sep 78.

I.5 Select Instructional Settings

Schulz, R. E. Job aid for selecting instructional settings. Human Resources Research Organization, Alexandria, VA, Sep 78.

PHASE II. DESIGN

II.1 Develop Objectives

Schulz, R. E. Job aid for developing objectives. Human Resources Research Organization, Alexandria, VA, Sep 78.

II.2 Develop Tests

Roid, G. and Haladyna, T. A handbook on item writing for criterion-referenced tests. Naval Personnel Research and Development Center, San Diego, CA, 1979.

Schulz, R. E., Hibbits, N., Wagner, H. and Seidel, R. J. On-line authoring aids for instructional design. US Army Research Institute for the Behavioral and Social Sciences, Alexandria, VA, in press.

Swezey, R. W. and Pearlstein, R. B. Guidebook for developing criterion-referenced tests. Report, Army Research Institute for the Behavioral and Social Sciences, Alexandria, VA, Aug 75 (AD A014 987).

*Interservice Procedures for Instructional Systems Development, TRADOC Pamphlet 350-30.

II.3   <u>Describe Entry Behavior</u>

II.4   <u>Determine Sequence and Structure</u>

PHASE III. DEVELOPMENT

III.1   <u>Specify Learning Events/Activities</u>

III.2   <u>Specify Instructional Management Plan And Delivery System</u>

Schulz, R. E. Job aid for specifying instructional management plan and delivery system. Human Resources Research Organization, Alexandria, VA, Jan 79.

III.3   <u>Review/Select Existing Materials</u>

Schulz, R. E. Job aid for review and selection of existing material. Human Resources Research Organization, Alexandria, VA, Oct 78.

III.4   <u>Develop Instruction</u>

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Braby, R., Parrish, W. F., Guitard, C. R., and Aagard, J. A. Computer-aided authoring or programmed instruction for teaching. TAEG Report 58, Training Analysis and Evaluation Group, Orlando, FL, Jun 78.

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Deterline, W. A. and Lenn, P. D. Coordinated instructional systems. Palo Alto, CA: Sound Education, 1972.

Kern, R. P., Sticht, T. G., Welty, D., and Hauke, R. N. Guidebook for the development of Army training literature. Human Resources Research Organization, Alexandria, VA, Nov 76 (AD A015 059).

III.5   <u>Validate Instruction</u>

Schulz, R. E. Job aid for validating instruction. Human Resources Research Organization, Alexandria, VA, Oct 78.

Wulfeck, W. H., Ellis, J. A., Richards, R. E., Wood, N. E., and Merrill, M. D. The instructional quality inventory: I. Introduction and overview. Special Report No. 79-3. Naval Personnel Research and Development Center, San Diego, CA, Nov 78.

PHASE IV.   IMPLEMENT

    IV.1   Implement Instructional Management Plan

    IV.2   Conduct Instruction

PHASE V.   CONTROL

    V.1   Conduct Internal Evaluation

    V.2   Conduct External Evaluation

    V.3   Revise System